NEWS SCIENCE NEWS

YES, THE EARTH IS EXPANDING!

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In NEXUS vol. 7, no. 6 (2000), and again in NEXUS vol. 8, no. 3 (2001), I introduced readers to the concept of an expanding Earth, whereby the Earth has been steadily increasing its radius, and hence its surface area, since the beginning of geological time some 4,600 million years ago.

My new book, outlining in detail the concept of an expanding Earth, is titled *Terra Non Firma Earth: Plate Tectonics is a Myth.* It is available in e-book format from http://www.oneoffpublishing.com and as a hard copy via email at Terrellapress@bigpond.com.

In this book, I have simply treated our Earth as just another cosmological entity, an insignificant microdot amongst many, amidst an unimaginably vast Universe. I then looked at modern geological, geophysical and geographical evidence to see not only what has happened to our Earth since its formation, but also to see if science has in fact got the interpretation of this evidence all wrong. To me, this evidence shows that the concept of an expanding Earth is uniquely viable and represents a demonstrable global tectonic process. Similarly all geological, geophysical and geographical information, when displayed on models of an expanding Earth, substantiates an Archaean to future Earth-expansion process and far better explains this readily available physical phenomenon.

By far the single most important contribution to modern scientific understanding of the concept of global tectonics, and Earth expansion in particular, has been the completion of geological mapping and age-dating of all the continental and ocean-floor crusts. This mapping was not available to early researchers prior to the late 1980s, and has since been significantly underutilised in plate tectonic studies.

In contrast to plate tectonic studies, this mapping has enabled the assemblage of all crustal plates to be accurately constrained on models of an expanding Earth, and for the first time has enabled modelling studies to be extended back to the earliest Archaean era. It has also provided a means to define Earth expansion mathematically, and a means to investigate an Earth expansion process mathematically throughout Earth history.

Plate Reconstructions

What this mapping shows is that the post-Triassic oceanic geology in particular (ocean crusts younger than about 165 million years ago) can be used to constrain latitudinally and longitudinally and assemble crustal plates on a smaller-radius Earth. Reconstruction of these crustal plates on models of an expanding Earth consistently show that each plate assembles with a single unique fit, with all plates assembling with a very high degree of accuracy along each of the mid-ocean-rift zones.

If these oceanic plate reconstructions were *mere* coincidence, then we should expect that the oceanic mapping, as well as evidence from adjoining continents, would not match across plate boundaries on models of an expanding Earth. The evidence, in fact, shows us that oceanic mapping *does* match across these plate boundaries, that all continental sedimentary basins *do* merge to form a global network of continental seas, that orogenic and fold mountain belts *do* coincide, and that ancient crustal regions *do* assemble together exactly.

This assemblage of oceanic crustal plates is shown to extend back to the Triassic period (200 million years ago), and demonstrates the viability and uniqueness of a post-Triassic Earth expansion process. This contrasts strongly with plate tectonics reconstructions for the same time interval, where assemblage of crustal plates is based on magnetic evidence preserved in crustal rocks and constrained by latitude only. Here, complex apparent-polar-wander paths are used to generate random, arbitrary, amalgamation-dispersal-amalgamation plate motion cycles on a constant-radius Earth.

The unique Earth expansion assemblage also contrasts strongly with the plate tectonics requirement to fragment continents arbitrarily in order to comply with the oceanic mapping data. It also contrasts with the requirement to dispose of huge areas of inferred pre-existing crust beneath subduction zones in order to maintain a constant surface area.

The utilisation of continental crustal geology to constrain a pre-Triassic expanding Earth crustal assemblage (continental crusts older than 165 million years ago) has never been done before. Early expanding-Earth researchers were limited simply to removing the oceans and visually fitting the remaining continents together on a smaller-radius Earth, and, as previously mentioned, plate tectonics researchers are constrained primarily by magnetic requirements, not crustal assemblage.

Spatial Assemblage Retained

What can be seen from the expanding Earth models (figure 1) presented in the *Terra Non Firma Earth* book is that all continental crust unites precisely to form a single pan-global crust during the Early Permian period and the bulk of the atmosphere and hydrosphere is returned to the mantle. During this time, continental sedimentary basins merge to form a global network coinciding with continental seas, and ancient continents and seas are defined by the variation in coastal outlines during Earth history.

When we progressively return these sedimentary basins to their pre-extension, pre-rift or pre-orogenic configuration on pre-Permian models of an expanding Earth (continental crust older than 250 million years), we see that the remaining crustal fragments making up our continents retain a unique spatial assemblage throughout Earth history. This unique spatial assemblage is maintained throughout the long history of Precambrian (older than 560 million years ago) and Palaeozoic (crust aged between 560 to 200 million years ago) crustal extension, prior to crustal rupture during the Late Palaeozoic era, followed by continental break-up and dispersal of the modern continents during opening of the modern oceans.

Again, this unique assemblage of all crustal fragments on models of an expanding Earth demonstrates that Earth expansion, extending back to the beginning of the Earth's geological past, is again viable. What these Archaean (crust older than 2,500 million years) to present-day models demonstrate is that, rather than being a random, arbitrary, amalgamation-dispersal-amalgamation crust-forming process (as we are currently led to

believe), crustal development on an expanding Earth is instead a simple, evolving and predictable crust-forming process.

It is significant to reiterate that on models of an expanding Earth, each of the established Precambrian and Palaeozoic crustal assemblages merge together to form a global network of sedimentary basins on a common pan-global crust. The mergence of each of these crustal settings shows us that global crust-forming processes—such as sedimentary basin extension, crust mobility, orogenesis, mountain building, distribution of metals, and so on—all correlate precisely with the overall development of the crust.

In my book, I show that the global network of sedimentary basins from each of the continents also unites to form a global network of crustal weakness, operating throughout the Precambrian and Palaeozoic eras. It is within this network of global crustal weakness that crustal extension—generated during ongoing Earth expansion—is focused, as well as ongoing crustal mobility, mantle-derived heat flow, magmatic activity, crustal rupture, continental break-up and the eventual opening of each of the modern oceans.

On my expanding Earth models, this break-up of the ancient continental crust results in a disruption of the established polar ice-caps, a disruption of the ancient continental seas, changes to sea levels and a disruption of established climatic zones. These disruptive changes in turn affect plant and animal species' habitats and drive the evolution of these species, their long-term decline or their periodic extinction.

I also show that when imposed constant Earth surface area and constant Earth radius premises are removed from geophysical observations, these same geophysical observations, when applied to models of an expanding Earth, demonstrate that the data are consistent with an expanding Earth. Similarly, geographical and biogeographical information, when applied to expanding Earth models, aptly quantifies crustal development on an expanding Earth and quantifies the locations of the ancient magnetic poles and equators determined from the unconstrained geophysical data.

The application of ancient magnetic measurements to models of an expanding Earth shows us that all ancient magnetic poles cluster as diametrically opposed north and south poles on each model constructed. This diametrically opposed clustering of poles is impossible on conventional plate tectonics reconstructions, where pole data are instead used to generate complex apparent-polar-wander paths. When used to determine an ancient Earth radius, this same magnetic evidence, traditionally used to negate Earth expansion, in fact *confirms* Earth expansion.

An interrogation of published space-based geodetic solutions to the Earth's geodetic network, while shown to be non-conclusive, also suggests that raw observational satellite data are being routinely constrained to a static-radius Earth, thus precluding their relevance to Earth expansion.

While published geodetic measurements are routinely quoted to sub-centimetre accuracy, large unexplained fluctuations in Earth radius for most observation sites throughout the world tell us that mathematical solutions to the present Earth radius are not as sufficiently well constrained for use in vertical plate motion studies as they are for horizontal motions. For horizontal plate motion studies, published results for current-day horizontal motion of the major plates are shown to be close to the million-year average-motion

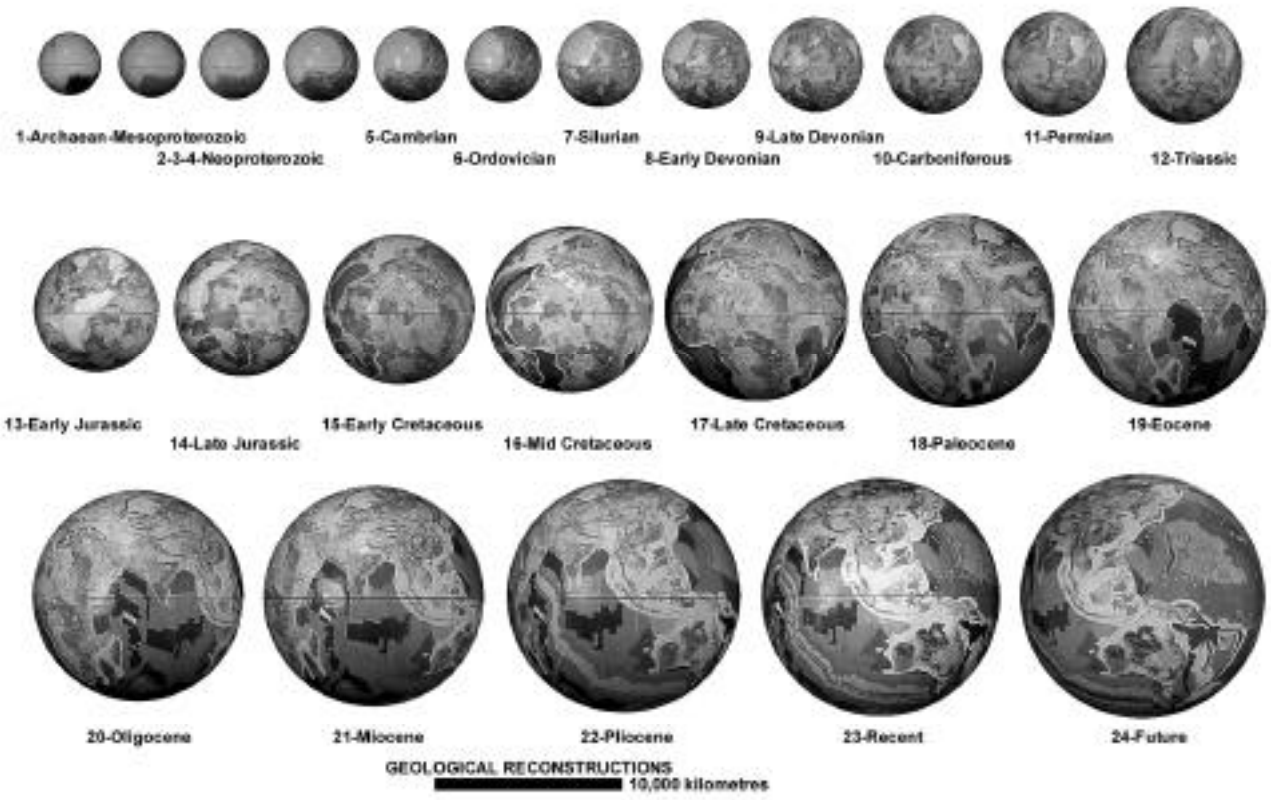

Figure 1: The complete range of spherical Archaean to future expanding Earth geological models constructed. The models show the relative increase in Earth radii through time, and show both the continental and oceanic geology. The models range in age from the Late Archaean to the present day, and the final model (no. 24) is projected five million years into the future.

vectors determined from oceanic mapping. This conclusion is consistent with Earth expansion, and in fact forms the basis for model construction.

Ancient Seas and Supercontinents

When I plotted the published coastal geography on expanding Earth models, I saw that the large, ancient Panthallassa, Tethys and Iapetus oceans of plate tectonics are not present on a smaller-radius expanding Earth. Instead, this same coastal geography defines the presence of more restricted continental Panthallassa, Iapetus and Tethys seas, which, on an expanding Earth, represent precursors to the modern Pacific and Atlantic oceans and the emergent Eurasian continent.

From this coastal geography, the emergent land surfaces on models of an expanding Earth equate to Rodinia, Gondwana and Pangaea—the assemblages of supercontinents and smaller sub-continents of plate tectonics theory. Instead of fragments of these ancient continents randomly colliding, breaking up and dispersing to reassemble arbitrarily as new supercontinents, the coastal geography on the expanding Earth models demonstrates an evolutionary development of each of the ancient continents throughout Earth history.

On each expanding Earth model, this evolutionary development of the ancient supercontinents is found to be intimately related to changes in sea level, with no requirement for random continental assemblage or crustal break-up. What the coastal geography shows is that the outlines of emergent supercontinents are intimately related to changes in the outlines of continental sedimentary basins, to changes incurred during crustal mobility, to climate changes, and to changes in sea levels as the modern oceans developed and rapidly opened to the present day.

Distribution of Species and Minerals

When examples of faunal and floral species are plotted on expanding Earth models, the distributions illustrate the ease and simplification of migration and species development. These cosmopolitan and provincial distributions and inter-relationships are maintained without the need for complex plate tectonic continental assemblage-dispersal requirements. This contrasts strongly with plate tectonics reconstructions, where assemblages and movements of the continents do not correspond to the known or necessary migration routes required by the established species distribution boundaries.

During continental break-up and opening of the modern oceans on an expanding Earth, the traditional migration routes of the various species are then shown to be disrupted, enabling species endemic to the various regions to interact and extend their boundaries with time. The timing of species development is then shown to be reflected intimately in the changes to sea level and the opening of the modern oceans. This timing either facilitated species migration by extending and expanding on existing migration routes or caused species extinction because of failure to adapt to the changing conditions.

The distribution of climate-dependent rocks (such as limestone, coal and glacial rocks) as well as biotic species shows that these rocks and species coincide precisely with the climatic zones expected on an expanding Earth. Each of these climatic indicators also displays a distinct latitudinal zonation, paralleling the ancient equator, and a distinct northward shift in climatic zonation, suggesting that an inclined Earth rotational axis—inclined to the pole of the ecliptic—was well established during the Palaeozoic era and has persisted to the present day.

The distribution of metals and petroleum products on an expanding Earth also shows global clustering into distinct provinces, and the timing of formation coincides with well-established global tectonic events. The recognition of these ancient metal and petroleum provinces on the present Earth is shown in the book to enable mineral search and genetic relationships to be extended beyond their known localities. The distribution of metal deposits and the nature and styles of mineralisation in time and space also suggest that there has been an evolutionary trend in the concentration of metals as well as in the diversity of the various types of mineral and petroleum occurrences.

A Causal Model for Earth Expansion

To round off the investigation into the concept of an expanding Earth, I was then compelled at least to speculate on a causal model for Earth expansion. It is emphasised that, while speculative, this does not in any way detract from the vast amount of empirical global geological, geophysical and geographical evidence presented in the book to support Earth expansion.

It is an unfortunate human trait that requires us instinctively to want to know or at least comprehend the cause well before the evidence, which far too often blinds us from fully understanding the physical evidence available to us. This is equally true for Earth expansion as it originally was for plate tectonics, where for a long time plate tectonics was rejected by science because of a lack of a suitable cause for crustal or plate motion.

The proposed causal model for Earth expansion presented in my book involves the generation of and an increase in mass within the core. This new matter accumulates at the core–mantle interface and the increase in volume results in a swelling of the mantle. Mantle swell is then transferred to the outer crust as continental crustal extension and also extension along the mid-ocean-rift zones. This matter-generation process is considered ultimately to result in a decay of the matter-formation process within the core and cessation of expansion with time.

So, what does the Earth really have to say? The evidence presented in my book tells us that an expanding Earth is indeed a viable and demonstrable global tectonic process. At no stage was any fundamental physical law, apart from human comprehension, violated during this investigation. I simply removed what was not previously there (young crustal rocks), to end up with a primitive Earth comprising an assemblage of equally primitive crustal components. I then simply displayed published physical evidence on the expanding Earth models created, and all of this evidence was shown to complement each other and substantiate an Earth expansion process.

While this evidence is compelling, it certainly makes me wonder why we continue to allow modern science to constrain our thinking to a static-radius Earth model. As I show in my book, the physical data suggest that the static-radius Earth of plate tectonics is a myth and that our Earth is, in reality, a *terra non firma* expanding Earth. ∞

About the Author:

Dr James Maxlow is a geologist with over 30 years' field exploration/mining experience. He gained his Master's degree in geology in 1995 and in 2002 was awarded a PhD in geology, majoring in global tectonics. He is principal researcher with Terrella Consultants, based in Western Australia, and senior project geologist with Newcrest Mining Ltd. He was a speaker at the NEXUS Conference in Brisbane last September.

To obtain a copy of Dr Maxlow's book *Terra Non Firma Earth* (see review this issue), email Anita Maxlow at Terrellapress@bigpond.com or purchase an e-book version from http://www.oneoffpublishing.com.

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